mediated control of aortic smooth muscle is impaired in the obese mice probably as a consequence of their high plasma glucose levels and/or dyslipidemia.

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ENDOTHELIN-1 AND NOREPINEPHRINE PHOSPHOLIPID-SIGNALLING MECHANISMS IN LARGE AND SMALL ARTERIES

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Although endothelin-1 (ET-1) and norepinephrine (NE) both stimulate rat arteries to contract via Ca release and influx pathways, the time course of the response differs both in large (aorta) and small (saphenous) arteries. NE (30 μM) stimulation of functional responses (tension, ^{42}K efflux) reached a maximum by 1 min whereas 5-10 min was required for ET-1 (100 nM). The tonic responses were similar. In Ca-free solution, NE induced phasic responses (about 2/3 max) while ET-1 caused only slowly developing contractures and increases in the ^{42}K efflux (about 1/5 max). NE also exceeded ET-1 2 fold as a stimulus for ^{45}Ca release and fura-2 fluorescence under these conditions. Biochemical measures indicated that both ET-1 and NE stimulate phospholipase C (inositol phosphate production) and D (phosphatidyl ethanol production, PEt) with phosphatidylcholine being a major substrate for PLD. The measures indicated, however, that NE>ET-1 as a stimulator of PLC, while ET-1>NE as a stimulator of PLD. For instance ET-1 stimulated Pet production in aorta 35% ($p<0.02$) more than NE during the first minute. Since PLC products (e.g. IP_3) are associated with Ca release while PLD products (free-base) are not, it is suggested that differences in the functional responses reflect a diversity of receptor-G-protein-phospholipase linkages. NE acts preferentially through an α_1-PLC pathway while ET-1 acts more through ET-PLD in rat aorta and saphenous arteries.

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CALCIUM LOCALIZATION IN SMOOTH MUSCLE

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Relationship between cytosolic Ca^{2+} ($[Ca^{2+}]i$) measured with fura-2 and contraction in smooth muscle was examined. In the rat aorta, 1 mM ATP and 100 μM α,ß-methylene ATP (mATP) induced transient increase followed by small sustained increase in $[Ca^{2+}]i$ with only small contraction. In Ca-free solution, 1 mM ATP, 10 μM prostaglandin F2α (PG) and 10 nM endothelin-1 (ET-1) induced transient increase in $[Ca^{2+}]i$ with only small contraction. These results suggest that increase in $[Ca^{2+}]i$ does not necessarily activate contractile elements. In the ferret portal vein, 10 μM norepinephrine (NE) induced transient increase in $[Ca^{2+}]i$ measured with aequorin and sustained contraction. Repeated applications of NE induced rapid decrease in aequorin signal without changing contraction. After a 15 hr resting period, aequorin signal recovered. These results suggest that NE makes a localized high Ca^{2+} area, and that aequorin in this area was rapidly consumed; and that aequorin slowly diffused from cytoplasm to this area. Consumption of aequorin was observed only in the presence of external Ca^{2+}. Taken together, there seem to be Ca^{2+} compartments in smooth muscle cells connected to Ca influx and/or Ca^{2+} releasing pathways. Ca^{2+} in this area does not seem to be utilized for contraction.

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LOCALIZATION OF DOPAMINE D_1 RECEPTORS IN ENDOTHELIUM OF RABBIT PULMONARY ARTERY

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We have reported high dopamine content in rabbit pulmonary artery [1]. Dopamine D_1 receptor-mediated relaxation was observed in isolated human pulmonary artery. Furthermore, about 60 % of D_1 receptor-mediated relaxation of isolated rabbit pulmonary artery was shown to be endothelium-dependent [2]. Then, the pharmacological characteristics and the anatomical localization of D_1-like receptors in rabbit pulmonary vessels were assessed using $[^3H]$-SCH 23390 as a ligand. Localization of D_1-like receptors in rabbit extra-pulmonary artery endothelial layers was found using combined radioreceptor assay and light microscope autoradiography [3]. Furthermore, $[^3H]$-SCH 23390 was bound to sections of lung belonging to a single class of high affinity sites (Kd=2.05 nM) in intrapulmonary arteries. The pharmacological profile suggests a specific binding to a population of the D_1 receptor subtype. Light microscope autoradiography showed the development of specific silver grains within the tunica intima (endothelial layer) and tunica media (smooth muscle layer) of

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